US007438003B2

(12) **United States Patent**
Wilfer

(10) **Patent No.: US 7,438,003 B2**
(45) **Date of Patent: *Oct. 21, 2008**

(54) **BURNING CONTAINER**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 490 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **11/185,292**

(22) Filed: **Jul. 20, 2005**

(65) **Prior Publication Data**

US 2005/0247297 A1 Nov. 10, 2005

Related U.S. Application Data

(63) Continuation-in-part of application No. 10/264,275, filed on Oct. 3, 2002, now Pat. No. 6,932,001.

(60) Provisional application No. 60/326,803, filed on Oct. 3, 2001.

(51) **Int. Cl.**
F23G 5/00 (2006.01)
F24C 1/16 (2006.01)

(52) **U.S. Cl.** ..... **110/241**; 110/251; 110/224; 110/25 B; 110/9 R

(58) **Field of Classification Search** ..... 110/241, 110/251, 308, 314, 336; 126/222–225, 9 R, 126/77, 25 B, 59, 152; 220/485
See application file for complete search history.

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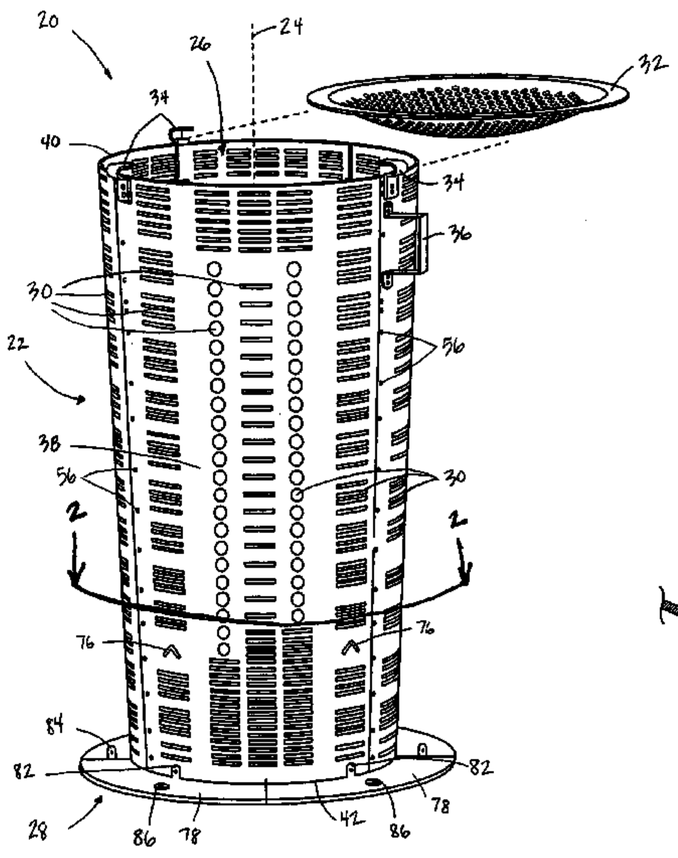
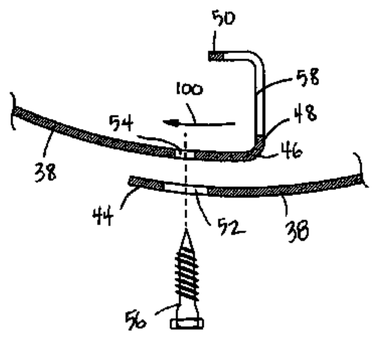
(57) **ABSTRACT**

A burning device includes a plurality of interconnected chamber walls defining a burning chamber and a central axis, each chamber wall also defining a plurality of chamber apertures. A plurality of flanges extend radially from the chamber walls and substantially parallel to the central axis, and a plurality of circumferentially extending lips extending from a respective flange. Each lip is radially spaced apart from an associated chamber wall and defines therebetween an air flow passageway communicating with the burning chamber and affording air flow into the burning chamber. Ventilation apertures are defined in at least one of the plurality of lips and the plurality of flanges, the ventilation apertures providing communication between the air flow passageways and the burning chamber. A cover is removably supported by the chamber walls and defines a plurality of apertures.

11 Claims, 6 Drawing Sheets





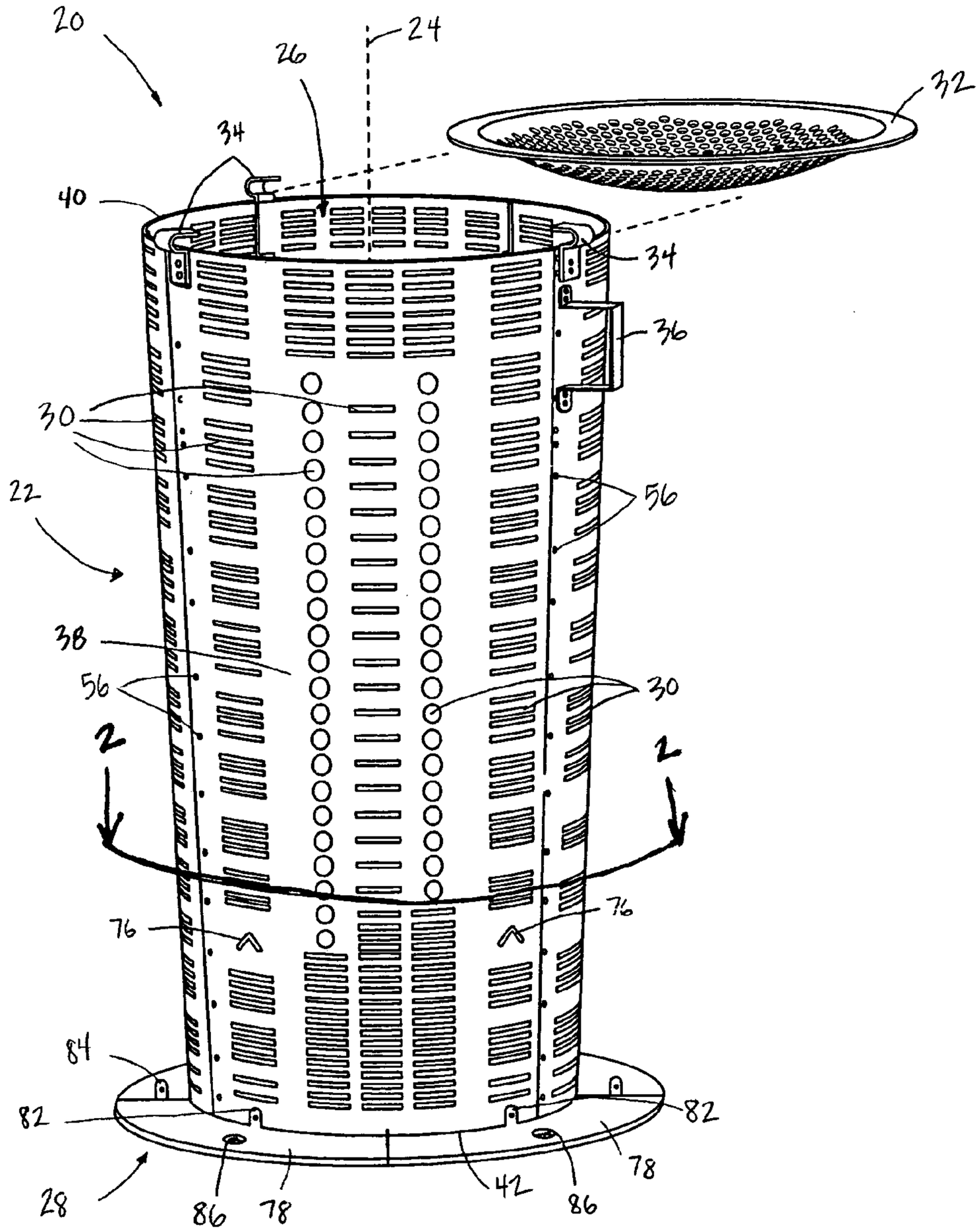

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FIG. 1

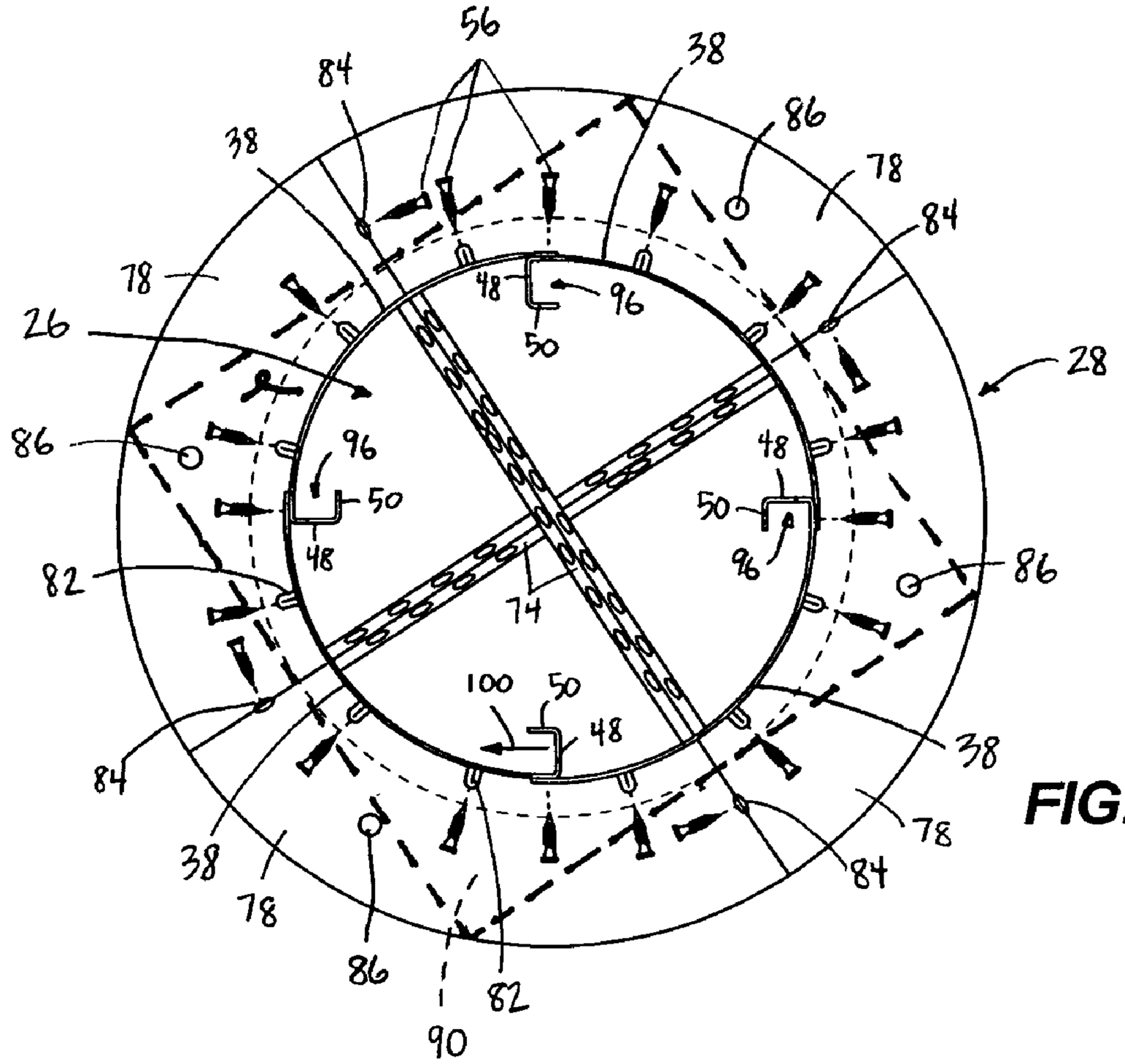
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FIG. 2

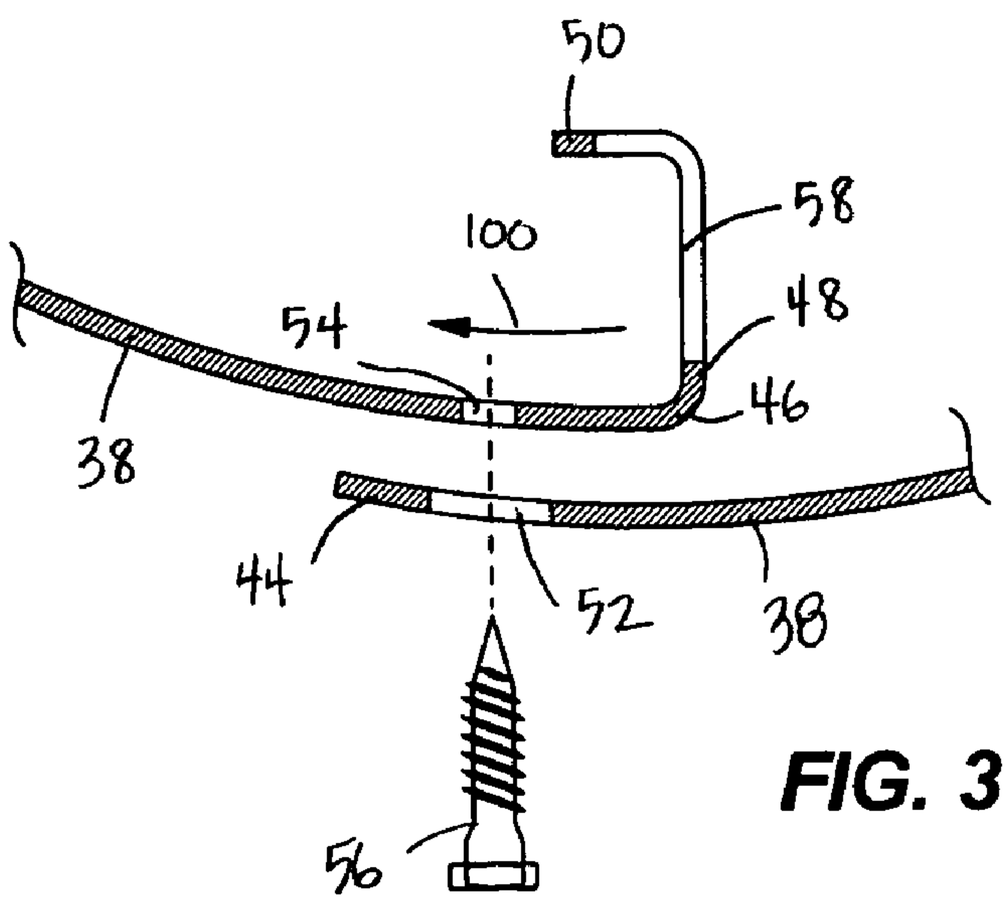
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FIG. 3

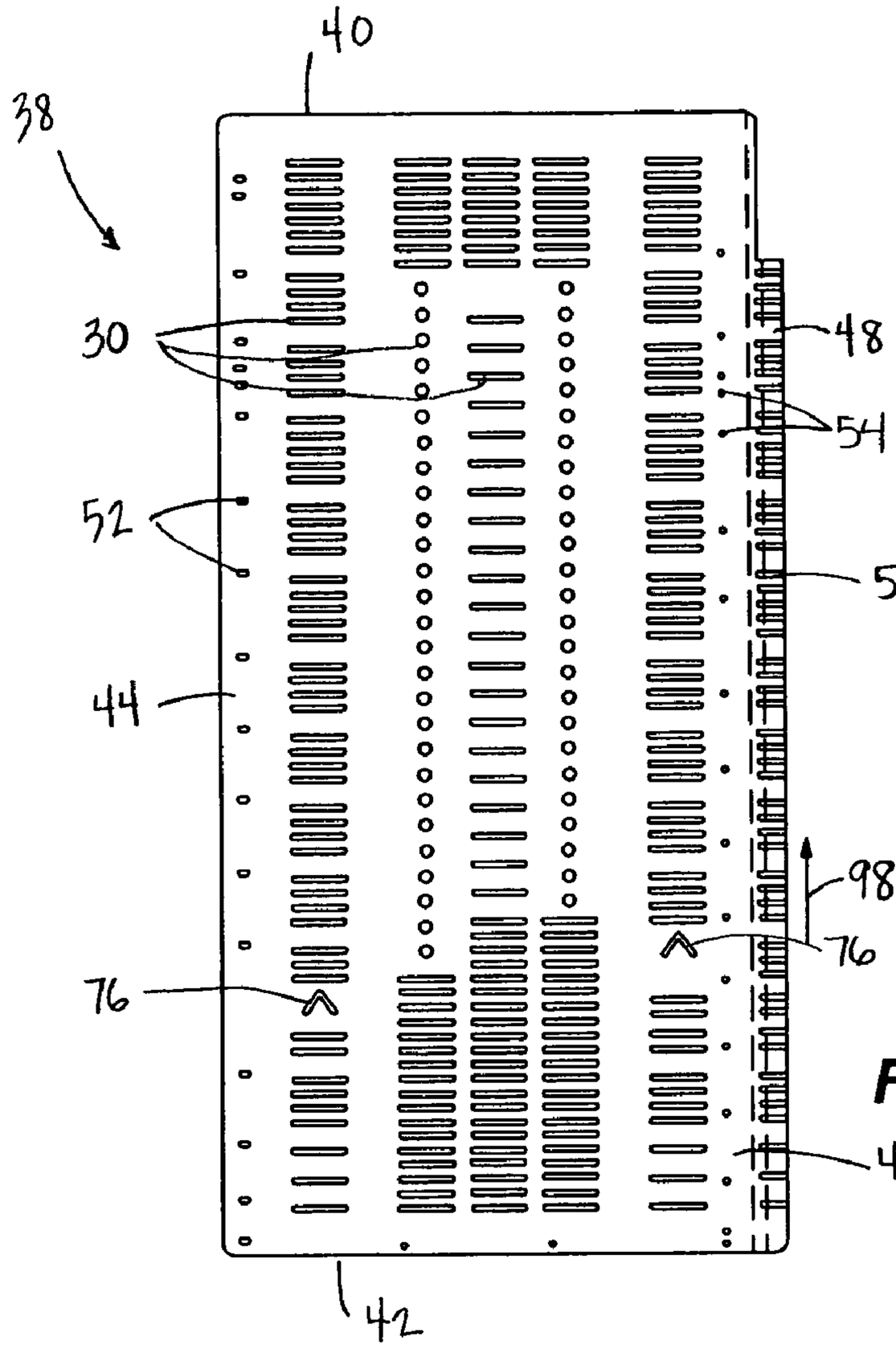

FIG. 4

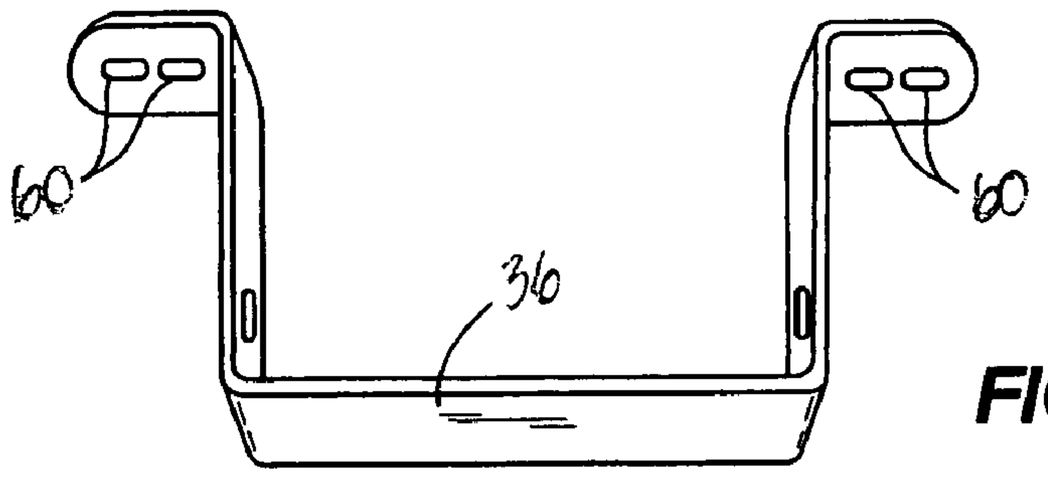

FIG. 5

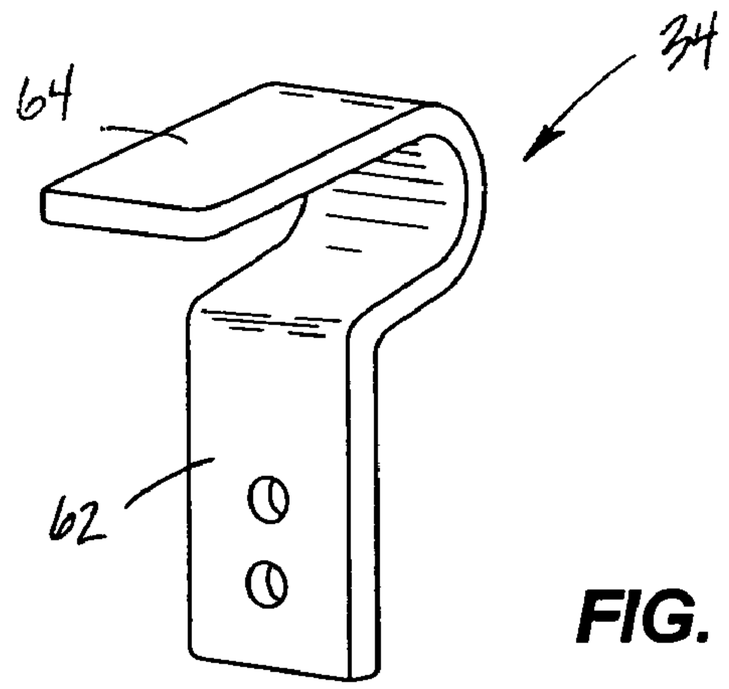

FIG. 6

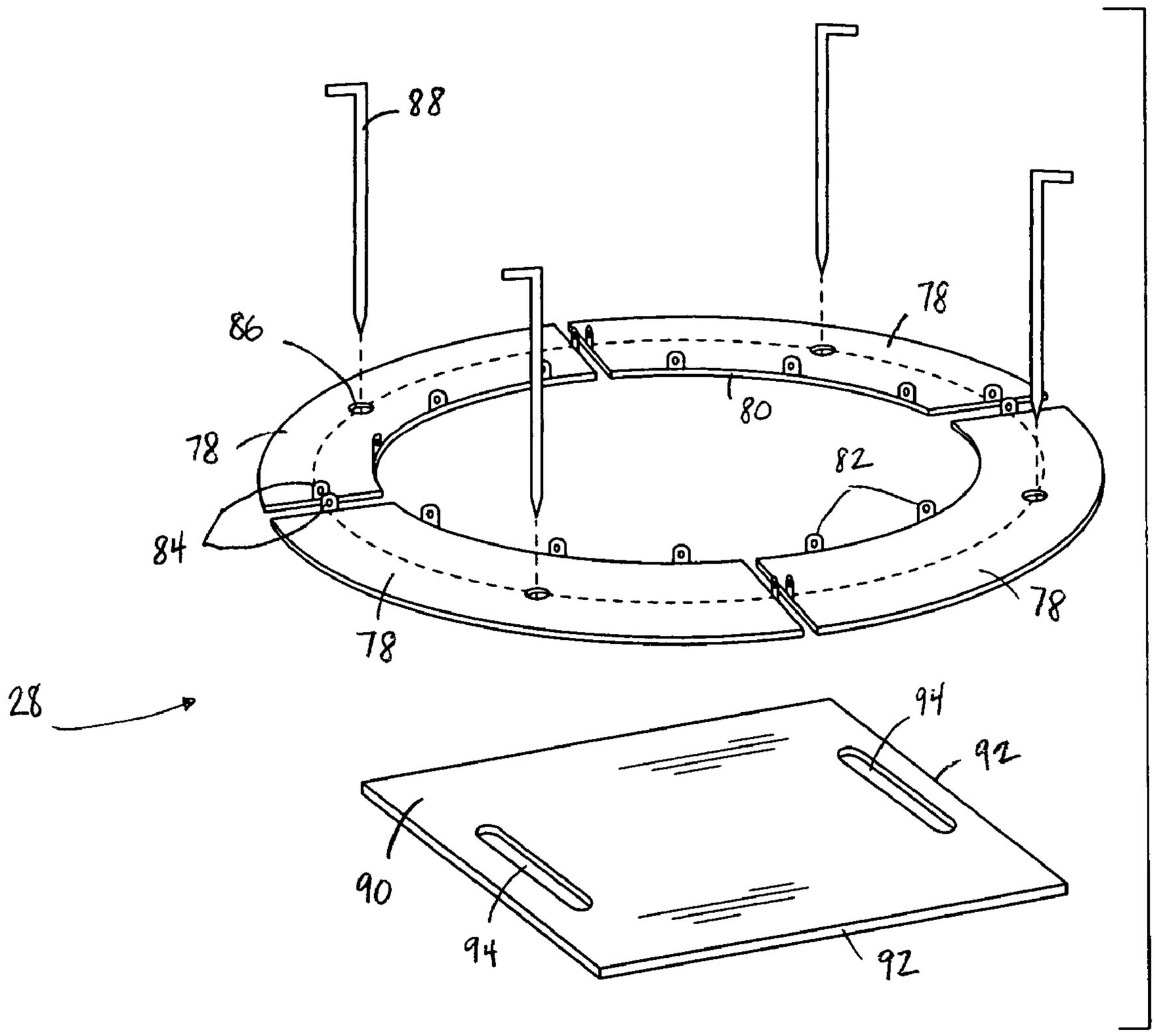

FIG. 9

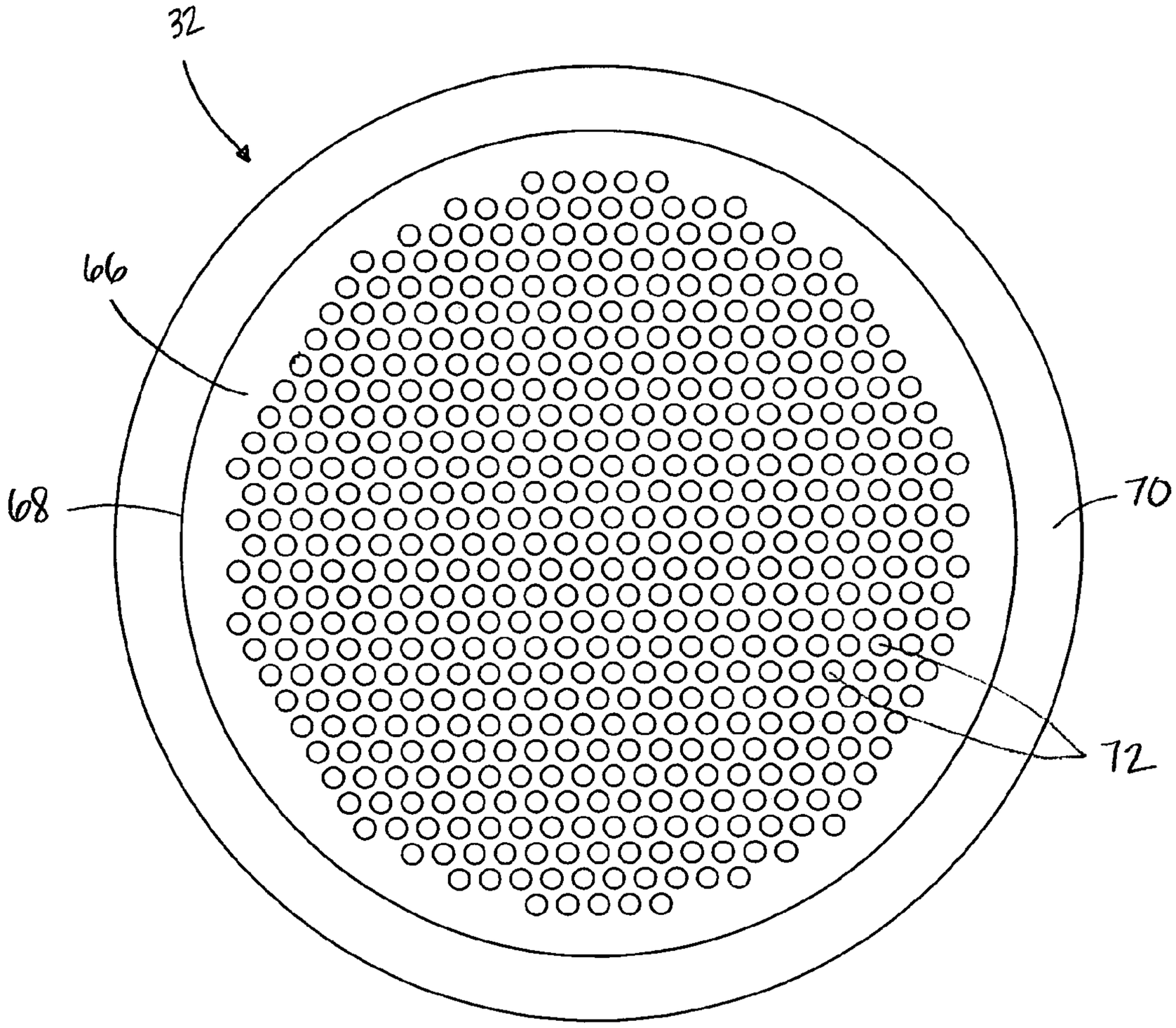

FIG.7a

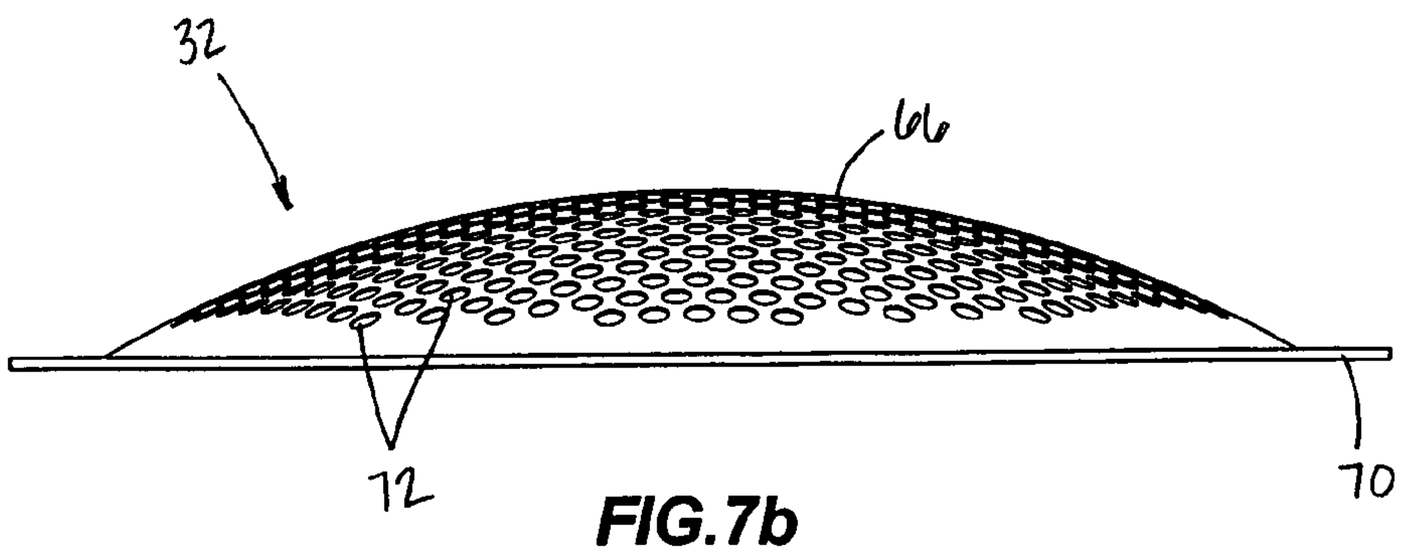

FIG.7b

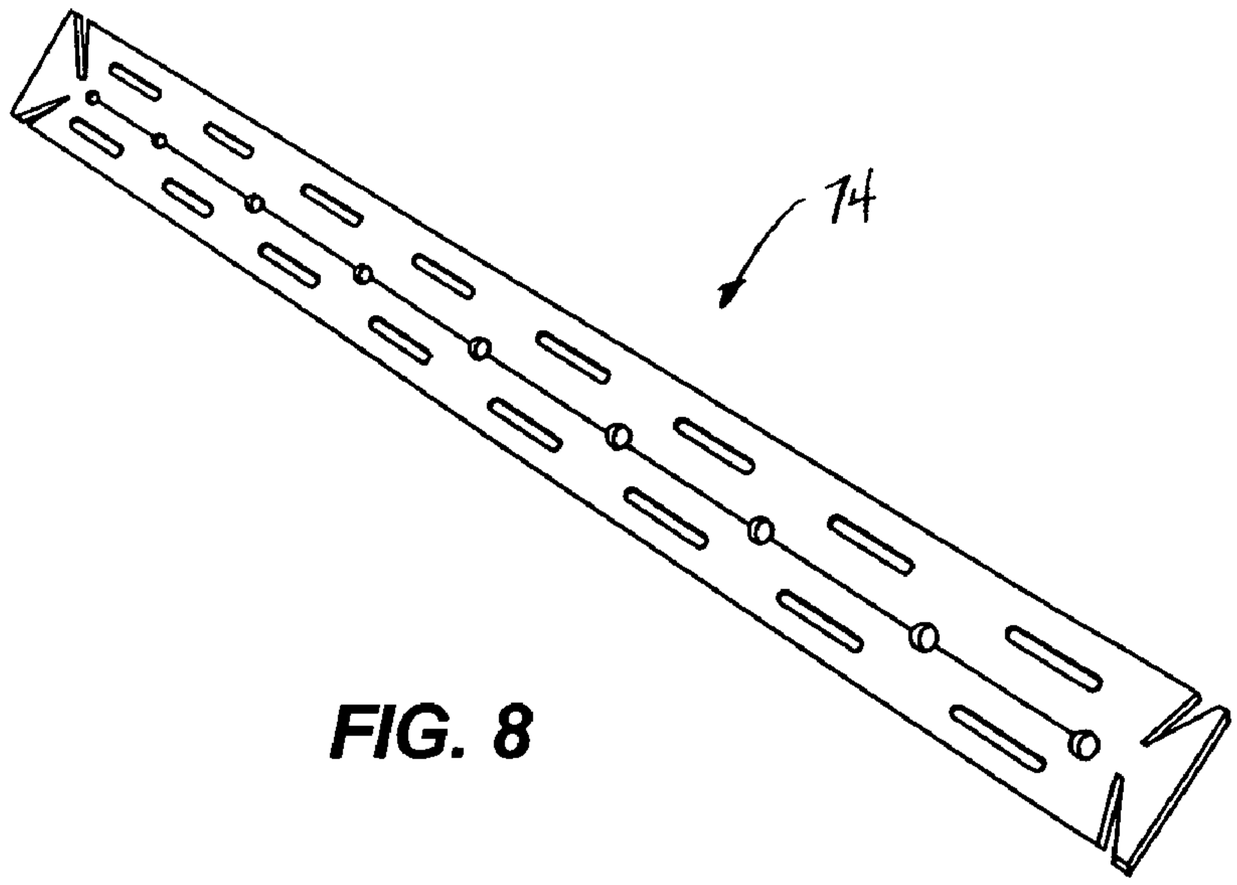
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FIG. 8

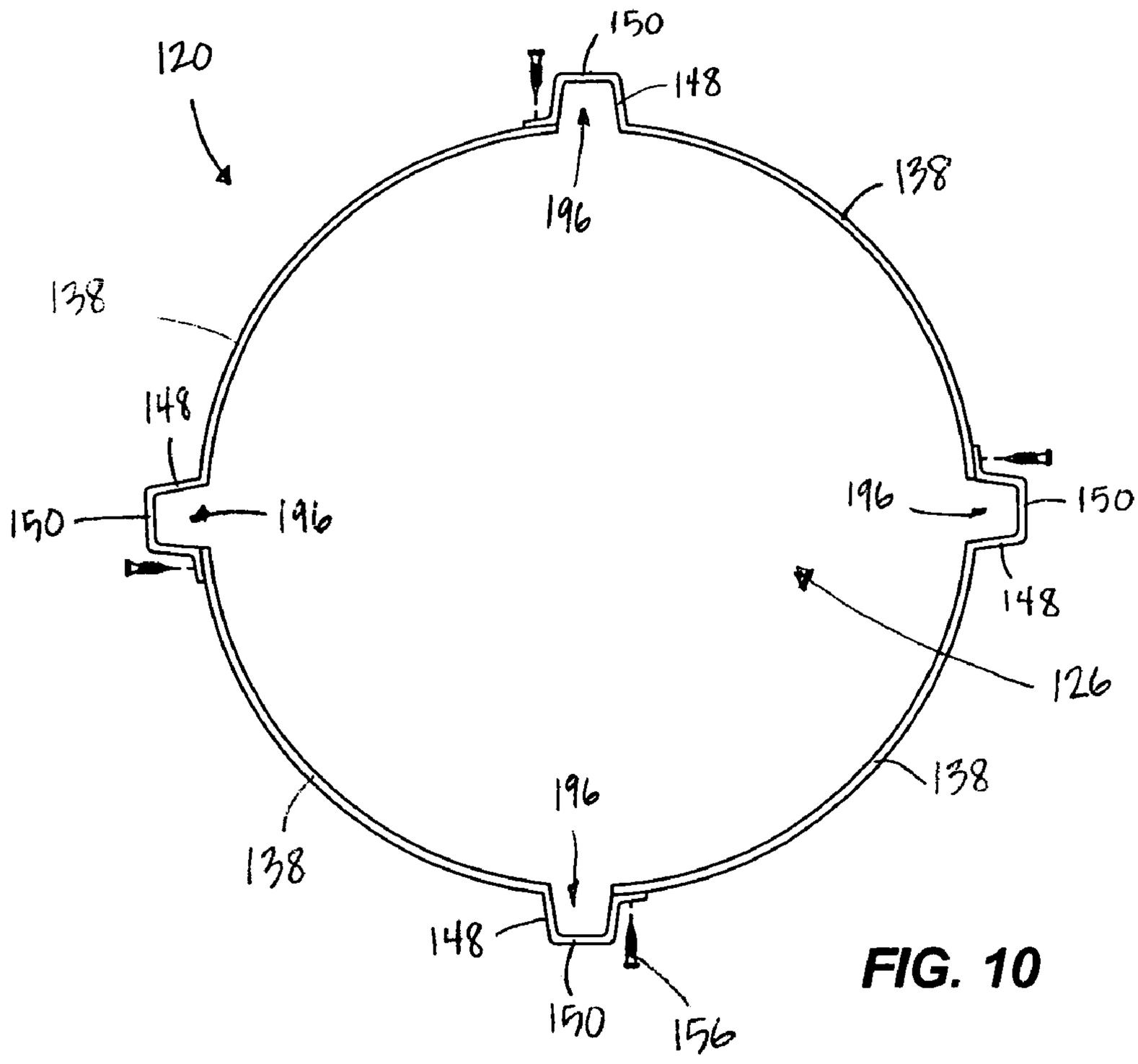
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FIG. 10

BURNING CONTAINER

CROSS REFERENCE TO RELATED APPLICATION(S)

This application is a continuation-in-part of U.S. patent application Ser. No. 10/264,275 filed Oct. 3, 2002, now U.S. Pat. No. 6,932,001, which claims the benefit of priority to U.S. provisional Patent Application No. 60/326,803 filed Oct. 3, 2001.

BACKGROUND OF THE INVENTION

The invention relates to a container for burning material such as yard waste, paper products, coal, wood and other flammable material. In addition, the container may be used as a grill.

Burning refuse has long been an efficient method for reducing large amounts of debris into comparatively small piles of soot and ash. Burning refuse in this manner reduces the amount of material placed into landfills and offers certain environmental advantages associated with the reduction of waste volume. In order to prevent the fire associated with burning the refuse from spreading uncontrollably, it has long been known to place the items to be burned into a container such as a drum or barrel, thereby containing the fire within a small, easily controlled area. Oftentimes holes or other apertures are formed in the barrel to increase airflow through the barrel, thereby improving the barrel's burning characteristics. Currently used burning barrels and drums often result in offensive smoking and smoldering, which is a result of poor airflow through the container.

SUMMARY OF THE INVENTION

The present invention provides a burning device including a plurality of chamber walls that define a burning chamber and a central axis. Each chamber wall also defines a plurality of chamber apertures. A plurality of flanges extend radially from the chamber walls and substantially parallel to the central axis. A plurality of circumferentially extending lips extend from ends of respective flanges, and each lip is radially spaced apart from an associated chamber wall. The lips cooperate with the associated chamber wall to at least partially define an air flow passageway communicating with the burning chamber and affording air flow into the burning chamber. Ventilation apertures are defined in at least one of the plurality of lips and the plurality of flanges, the ventilation apertures providing communication between the air flow passageways and the burning chamber. A cover is removably supported by the chamber walls and defines a plurality of apertures.

The present invention also provides a burning device including a plurality of panels interconnected to define a burning chamber and a central axis, each panel defining a plurality of ventilation apertures and having a top edge and a bottom edge. A plurality of flanges are formed integrally with the panels and extend radially with respect thereto from the bottom edge to the top edge, and a plurality of lips are formed integrally with the panels, each lip extending generally circumferentially from a respective flange. A plurality of ventilation apertures are formed in at least one of the plurality of flanges and of the plurality of lips. The panels, the flanges, and the lips operate to define angularly spaced apart air flow passageways that extend axially through the chamber.

The present invention also provides a method for assembling a burning device. The method includes forming a plurality of chamber panels, each panel having a top edge, a bottom edge, a free edge, a flange edge, and a flange extending from the flange edge. Each chamber panel also defines a plurality of apertures. The free edge of a first chamber panel is coupled to the flange edge of a second chamber panel, and additional chamber panels are coupled to the first and second panels to define a burning chamber having a central axis. The method further includes coupling a generally annular support ring to the bottom edges of the chamber panels. A cover defining a plurality of apertures is positioned on the top edges of the panels to overlie the chamber, wherein the cover is positionable with respect to the panels in more than one position.

Other features of the invention will become apparent to those skilled in the art upon review of the following detailed description and the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a burning container embodying the invention.

FIG. **2** is a section view taken along line **2-2** of FIG. **1**.

FIG. **3** is an enlarged exploded view of a portion of FIG. **2**.

FIG. **4** is a side view of a portion of the burning container illustrated in FIG. **1**.

FIG. **5** is a perspective view of a handle for the burning container illustrated in FIG. **1**.

FIG. **6** is a perspective view of a cover hook for the burning container illustrated in FIG. **1**.

FIG. **7**A is a top view of a cover for the burning container illustrated in FIG. **1**.

FIG. **7**B is a side view of the cover illustrated in FIG. **7**A.

FIG. **8** is a perspective view of a cross bar for the burning container illustrated in FIG. **1**.

FIG. **9** is an exploded view of a base assembly for the burning container illustrated in FIG. **1**.

FIG. **10** is a section view similar to FIG. **3** illustrating a container which is an alternative embodiment of the invention.

Before any embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of "including," "comprising," or "having" and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Unless specified or limited otherwise, the terms "mounted," "connected," "supported," and "coupled" and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings. Further, "connected" and "coupled" are not restricted to physical or mechanical connections or couplings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. **1-9** illustrate a burning container **20** embodying the invention and which is adapted for use to burn any number of materials. For example, the burning container **20** may be used as a cooking grill, an incinerator, a thermal shredder, a fireplace, or the like. Examples of fuel, or burning materials for the burning container **20** includes paper products, wood, yard refuse, coals, hickory or other burnable material.

Referring to FIG. **1**, the burning container **20** includes a cylindrical portion **22** having a central axis **24**, and a burning chamber **26**. The cylindrical portion **22** is supported by a base assembly **28** that is fixed to the cylindrical portion **22**. The cylindrical portion **22** also includes a plurality of apertures **30** that afford ventilation along substantially the entire length of the cylindrical portion **22**. The container **20** also includes a cover **32**, cover hooks **34**, and a handle **36**.

Referring also to FIGS. **2-4**, the cylindrical portion **22** includes a plurality of generally arcuate chamber panels **38** having formed therein the ventilation apertures **30**. In the illustrated embodiment, four panels **38** are used to define the chamber walls of the burning chamber **26**. Each panel **38** is similarly configured and includes a top edge **40**, a bottom edge **42**, a free edge **44**, and a flange edge **46**. A flange **48** extends radially from the flange edge **46** of each panel **38** and substantially parallel to the central axis **24**. A lip **50** extends from the end of each flange **48** and is circumferentially extending. Each lip **50** is radially spaced apart from an associated panel **38**. As seen in FIG. **4**, top edges of the flange **48** and the lip **50** are recessed from the top edge **40** of the panel **38**. The recess provides room for the cover **32** when attached to the burning container **20**. In further embodiments, no recess is formed between the top edges of the flanges **48** and the lips **50** and the top edges of the panels **38**.

A plurality of mounting slots **52** extend along the free edge **44** of each panel **38**, and a plurality of corresponding mounting holes **54** extend along the flange edge **46** of each panel **38**. The slots **52** and holes **54** are configured such that the panels **38** may be secured to each other by extending fasteners **56** through the mounting slots **52** of one panel **38** and into corresponding mounting holes **54** of an adjacent panel **38**. For ease of assembly, the fasteners **56** are preferably of the self-tapping type, however other types of fasteners and other fastening methods are possible as well. Additional panels **38** are secured to one another in the manner described above until the plurality of panels **38** form a complete cylinder. When the panels **38** are assembled, the flanges **48** of each panel **38** extend generally radially inward toward the central axis **24**, and the lips **50** of each panel **38** extend generally circumferentially with respect to the cylindrical portion **22**. Although illustrated panels **38** are semi-cylindrical, in a further embodiment the panels **38** may be flat and define a polygonal structure in place of the illustrated cylindrical portion **22**.

Those of ordinary skill in the art will readily understand that the flanges **48** and the lips **50** can be formed integrally with the panel **38**. As illustrated in FIG. **4**, the panel **38**, the ventilation apertures **30**, the mounting slots **52** and the mounting holes **54** are cut from a relatively flat sheet of material, such as a sheet of stainless steel or steel. The flat sheet can then be bent as required to form the flanges **48** and the lips **50**. In the illustrated embodiment, the bends that form the flanges **48** and the lips **50** are in the same direction. However, other methods for forming the panels **38**, including bending the flat sheet in different directions, or attaching the flanges **48** and lips **50** separately, can also be successfully used. In the illustrated embodiment, the flanges **48** and the lips **50**, like the rest of the panel **38**, have ventilation apertures **58** formed therein.

Referring also to FIGS. **1** and **5**, the handle **36** is secured to the cylindrical portion **22** by extending fasteners (e.g., the self-tapping fasteners **56** described above) through apertures **60** in the handles **36** and through the mounting slots **52** and mounting holes **54** of the panels **38**. In another embodiment, the handle **36** is mounted to the chamber panel **38** through apertures **30**.

Referring to FIGS. **1** and **6**, the cover hooks **34**, or clips, are secured to the cylindrical portion **22** in a similar manner. In the illustrated embodiment, three cover hooks **34** are attached to the top edges **40** of the panels **38**, and the cover hooks **34** are angularly spaced from one another by approximately 90 degrees. Each cover hook **34** includes a mounting portion **62** that is secured to one of the panels **38**, and a U-shaped portion **64** that extends over the top edge **40** of the panels **38**. The cover **32** is configured and adapted to overlap the top edges **40** of the assembled cylindrical portion **22** and is received by the U-shaped portions **64** of the cover hooks **34**, whereby the cover hooks **34** support the cover **32**. In further embodiments, fewer or more cover hooks may be used to attach the cover, and the cover hooks may be spaced greater or lesser distances apart.

FIGS. **1**, **7**A and **7**B illustrate the cover **32** of the burning container **20**, which when supported by the cylindrical portion **22** operates as a grill, ventilation means or a spark arrestor for the burning container **20**. The cover **32** includes a central, convex portion **66** having a peripheral edge **68**, and a flange portion **70** extending radially outward from the peripheral edge **68**. A plurality of apertures **72** are formed in the convex portion **66** of the cover **32** for providing ventilation to the burning chamber **26** while preventing sparks, large pieces of ash, and burning debris from exiting the burning chamber **26**.

In use, the cover **32** is supported by the cylindrical portion **22** by sliding the flange portion **70** into and out of position within the U-shaped portions **64** of the cover hooks **34**. In the embodiment illustrated in FIG. **1**, the cover **32** is positioned such that the convex portion **66** extends into the burning chamber **26**. In this configuration, the cover **32** may be used as a grill with food placed on a concave surface of the cover **32**. In another embodiment, the cover **32** is positioned such that the convex portion extends opposite the burning chamber **26**. In this configuration, the cover **32** is operable as a spark arrestor. In yet another embodiment, a flange extends axially outwardly from an outer edge of the flange portion **70** and away from the convex portion **66** to provide additional stiffness to the cover **32**.

Referring to FIGS. **2** and **8**, a pair of cross bars **74** having a generally V-shaped cross-section are configured to at least partially support burning material inserted into the burning chamber **26**. The cross bars **74** are inserted into generally V-shaped support apertures **76** formed in the panels **38** (shown in FIGS. **1** and **4**). Each cross bar **74** extends generally diametrically across the cylindrical portion **22** and is supported on each end by one of the panels **38**. Preferably, the cross bars **74** are inserted such that the V-shaped cross-section points generally upwardly and such that the cross bars **74** are at an angle of approximately 90 degrees to each other when viewed along the central axis **24**.

Referring to FIG. **9**, the base assembly **28** includes four arc-shaped portions **78** that are preferably formed from a relatively flat sheet of metal. Each arc-shaped portion **78** includes an inner edge **80** along which is formed a plurality of longitudinally extending mounting tabs **82**. In some embodiments, the mounting tabs **82** are formed integrally with the arc-shaped portions **78** and are bent generally upwardly to receive the cylindrical portion **22**. As illustrated, the mounting tabs **82** engage the outside surfaces of the panels **38** and are secured thereto using fasteners, such as the self-tapping fasteners **56** described above. In the illustrated embodiment, the arc-shaped portions **78** attach to the outside surfaces of the panels **38** so that ash is permitted to fall through the burning chamber **26** to the ground. Each arc-shaped portion **78** also includes a pair of coupling tabs **84**. The coupling tabs **84** are provided such that four arc-shaped portions **78** are securable to one another to define a generally annular support ring.

When the burning container **20** is fully assembled, the bottom edges **42** of the panels **38** rest upon the arc-shaped portions **78** between the inner edges **80** and the mounting tabs **82**. The arc-shaped portions **78** also include grounding apertures **86** that are spaced along the annular ring. The grounding apertures **86** receive stakes **88** that are insertable into the ground to secure the base assembly **28** and the cylindrical portion **22**. It should be readily apparent to one skilled in the art that the support ring can be formed of fewer or more portions, including a one-piece ring.

In FIG. **9**, the base assembly **28** also includes a base plate **90**. In the illustrated embodiment, the base plate **90** is generally rectangular and includes sides **92** having a length that is longer than an inner diameter of the support ring, but smaller than an outer diameter of the support ring. In this way, the base plate **90** substantially completely overlies a bottom portion of the burning chamber **26**, but does not extend so far as to prevent the insertion of stakes **88** through the grounding apertures **86**. The base plate **90** also includes a pair of slots **94** that define handles. The base plate **90** affords easy collection and disposal of ash, as discussed further below. In a further embodiment, the base assembly **28** does not include the base plate **90**.

The burning container **20** can be assembled from the various components by coupling the free edge **44** of a first panel **38** to the flange edge **46** of a second panel **38**. Additional panels **38** are then coupled to the first and second panels **38** in a similar manner until a complete cylinder is formed, thereby defining the cylindrical portion **22**, the central axis **24** and the burning chamber **26**. As the panels **38** are coupled together, the flanges **48** are positioned to extend radially inward with respect to the central axis **24**. The cover hooks **34** and the handle **36** are attached to the panels **38** using the mounting slots **52** and mounting holes **54** of the panels **38**, although other apertures for securing the cover hooks **34** and the handle **36** may be used. The assembled cylindrical portion **22** is then secured to the base assembly **28**. The cross bars **74** are inserted through the support apertures **76** and the cover **32** is then positioned on the top edges **40** to overlie the burning chamber **26**.

In operation, the burning container **20** is preferably positioned on relatively soft ground such as sand or dirt. The stakes **88** are inserted into the ground to secure the base assembly **28** and the cylindrical portion **22** against undesired movement or overturning. Burnable material, such as paper, wood, yard refuse, coals, hickory or the like, are positioned inside the burning chamber **26**. The burnable material is supported at least partially by the cross bars **74**, and may also rest on the base plate **90** or the ground. The burnable material is supported along the sides of the burning chamber **26** at least partially by the inwardly extending flanges **48** and the circumferentially extending lips **50**.

The flanges **48** and the lips **50** cooperate to provide a chimney-like air flow passageway **96** that keeps burning material away from the panels **38** in the area of the flanges **48** and that allows air to flow along the sides of the burning chamber **26** in the direction shown by arrow **98** in FIG. **4**. As can be seen in FIG. **2**, the panels **38** define a first outer diameter and the lips **50** define a second inner diameter, whereby the air flow passageways **96** are defined between the first and second diameters. It should be readily apparent to those of skill in the art that air flows in direction **98** within and outside of air flow passageways **96**. Further, ventilation apertures **58** formed in the flanges **48** and the lips **50** that define the air flow passageways **96** afford air flow into the burning chamber **26** transverse to the central axis **24**, as shown by arrow **100** in FIGS. **2** and **3**. The flanges **48** also assist in preventing burning material from overlying the ventilation apertures **30** to further improve air flow through the burning chamber **26**. In a further embodiment, the specific size and configuration of the flanges **48** and the lips **50** may be modified to achieve certain desired burning characteristics.

Preferably, the cover **32** is positioned over the burning chamber **26** and the burnable material is ignited through any of the ventilation apertures **30**. Alternatively, the burnable material may be ignited from the top, before the cover **32** is positioned within the U-shaped portions **64** of the cover hooks **34**. As the burnable material burns, air is drawn into the burning chamber **26** through the ventilation apertures **30**, and air flows generally upwardly through the air flow passageways **96** defined by the flanges **48** and lips **50** before exiting through the apertures **72** in the cover **32**. The sizing and positioning of the ventilation apertures **30** and the cover apertures **72** are such that large pieces of ash and/or debris are substantially prevented from leaving the burning chamber **26**, while a substantial amount of air flow is maintained through the burning chamber **26**. When the burnable material has completely burned and the burning container **20** has cooled, the stakes **88** are removed from the base assembly **28** and the cylindrical portion **22** and arc-shaped portions **78** are lifted or rolled away from the base plate **90**, leaving a pile of ashes on the base plate **90**. The base plate handles **94** may then be used to carry the base plate **90** and the pile of ashes to an appropriate container for disposal.

FIG. **10** illustrates an alternative embodiment of a burning container **120**. Features and components of the burning container **120** that are the same or similar to features and components of the burning container **20** have been given like reference numerals, increased by one-hundred. The burning container **120** is similar to the container **20**, however the flanges **148** of the panels **138** extend radially outward, as opposed to radially inward. The lips **150** extend circumferentially from the ends of the flanges **148** and are coupled to an adjacent panel **138**. The air flow passageways **196** of the container **120** extend along the burning chamber **126** in a similar manner as the air flow passageways **96**, but are positioned radially outward with respect to the panels **138**. Other orientations and configurations of the panels, flanges, lips, and passageways are possible as well.

Various features of the invention are set forth in the following claims.

The invention claimed is:

1. A burning device comprising:

a plurality of interconnected chamber walls defining a burning chamber and a central axis, each chamber wall also defining a plurality of chamber apertures;

a plurality of flanges extending radially from the chamber walls and substantially parallel to the central axis;

a plurality of circumferentially extending lips, each of the plurality of lips extending from a respective flange, each lip being radially spaced apart from an associated chamber wall and defining therebetween an air flow passageway communicating with the burning chamber and affording air flow into the burning chamber;

ventilation apertures defined in at least one of the plurality of lips and the plurality of flanges, the ventilation apertures providing communication between the air flow passageways and the burning chamber; and

a cover removably supported by the chamber walls and defining a plurality of apertures.

2. The burning device of claim **1** wherein the cover includes a convex portion that has the plurality of apertures and a flange portion extending radially outward from a peripheral edge of the convex portion.

3. The burning device of claim 2 wherein the flange portion is removably supported by the chamber walls.

4. The burning device of claim 2 wherein the cover is removably support by the chamber walls in a first position, in which the convex portion extends into the burning chamber, and second position, in which the convex portion extends opposite the burning chamber.

5. The burning device of claim 1, and further comprising at least one hook coupled to a top edge of one of the plurality of chamber walls wherein the at least one hook removably supports the cover.

6. The burning device of claim 1 wherein the chamber walls include a top edge and further wherein a top edge of at least one of the plurality of flanges and the respective lip is recessed from the top edge of the chamber walls.

7. The burning device of claim 1, and further comprising a support ring removable securable to bottom edges of the chamber walls wherein the support ring is comprised of a plurality of portions.

8. A method for assembling a burning device comprising:

forming a plurality of chamber panels, each being similarly formed to include a top edge, a bottom edge, a free edge, a flange edge, and a flange extending from the flange edge, at least one chamber panel defining a plurality of apertures;

coupling the free edge of a first chamber panel to the flange edge of a second chamber panel;

coupling additional chamber panels to the first and second panels as needed to define a burning chamber having a central axis;

providing a generally annular support ring that is securable to the ground;

coupling the bottom edges to the support ring; and

positioning a cover defining a plurality of apertures on the top edges of the panels to overlie the chamber wherein the cover is positionable with respect to the panels in more than one position.

9. The method of claim 8, and further comprising positioning the cover such that a convex portion of the cover defining the plurality of cover apertures extends into the burning chamber.

10. The method of claim 8, and further comprising positioning the cover such that a convex portion of the cover defining the plurality of cover apertures extends opposite the burning chamber.

11. The method of claim 8 wherein positioning the cover comprises positioning an outer peripheral edge of the cover within at least one hook coupled to the top edge of at least one panel, wherein the at least one hook removably supports the cover.

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